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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,985	10/24/2003	Peter Wayte	126987/11915 (21635-0112)	1740
31450 7590 12/14/2007 MCNEES WALLACE & NURICK LLC 100 PINE STREET P.O. BOX 1166 HARRISBURG, PA 17108-1166			EXAMINER ROE, JESSEE RANDALL	
			ART UNIT 1793	PAPER NUMBER
			MAIL DATE 12/14/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/692,985

Applicant(s)

WAYTE ET AL.

Examiner

Jessee Roe

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 21-22 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-18 and 21-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of the Claims

Claims 1-18 and 21-22 are pending wherein claims 7 and 10 are amended; claims 2 and 11 are withdrawn from consideration; and claims 19-20 are canceled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-5, 10, 12-14 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakrabarti et al. (US 4,898,624) in view of the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org and Andinolfi et al. (US 4,563,239).

Claims 1, 3-5, 10, 12-14 and 21-22 are rejected on the same grounds as set forth in the Office Action of 17 August 2007.

In response to the amended feature of claim 10, the change in scope does not alter the grounds of rejection.

Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakrabarti et al. (US 4,898,624) in view of the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by

www.web.archive.org and Andinolfi et al. (US 4,563,239), and further in view of the ASM Handbook Volume 4.

Claims 6 and 15 are rejected on the same grounds as set forth in the Office Action of 17 August 2007.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakrabarti et al. (US 4,898,624) in view of the website disclosure of the Titanium Materials Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org and Andinolfi et al. (US 4,563,239), and further in view of the ASM Handbook Volume 4.

Claims 7 and 16 are rejected on the same grounds as set forth in the Office Action of 17 August 2007.

In response to the amended feature of claim 7, the amendment does not change the scope of the claim.

Claims 8-9 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakrabarti et al. (US 4,898,624) in view of the website disclosure of the Titanium Materials Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org and Andinolfi et al. (US 4,563,239), and further in view of Bewlay (US 6,370,956).

Claims 8-9 and 17-18 are rejected on the same grounds as set forth in the Office Action of 17 August 2007.

Response to Arguments

Applicant's arguments filed 12 October 2007 have been fully considered but they are not persuasive.

First, in response to applicant's argument that there is no objective basis for combining the references Chakrabarti et al. ('624) and the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Although, Chakrabarti et al. ('624) do give examples where the forgings would be 1 inch in thickness, Chakrabarti et al. ('624) do not limit the size of the forgings to only 1 inch in thickness. Table III gives fracture toughness values for both forgings less than 1 inch and greater than 1 inch and the disclosure of Chakrabarti et al. ('624) is directed toward the manufacture of impellers and other parts (col. 1, lines 24-34). Chakrabarti et al. ('624) combined with the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org would provide a maximum processing thickness of four inches because the Titanium Metals Corporation teaches that sections thicker than this would not properly respond to solution treatment and aging, which overlaps the thickness of the instant invention. However, merely scaling up the prior art process would not establish patentability in a claim to an old process so scaled. MPEP 2144.04 (IV)(A).

references have no such teaching (Non-Final Office Action, page 3, lines 4-5 from bottom of page) of quenching to room temperature and further argues that cooling rate is the rate of change of temperature with time, and final temperature is the temperature reached at the end of the quenching . In response, the Examiner notes that the recited process steps are the same for the prior art and the instant invention and the principal difference between the prior art and the instant invention is a temperature difference. However, the Applicant has not established the criticality of that difference. Ex parte Khusid, Bezgodova, and Ruben, 174 USPQ 59 (BPAI 1971).

Third, the Applicant primarily argues that Chakrabarti et al. ('624) teach two different aging processes. The first would be a two-step process including a step of heating at 1275-1525°F for 1 hour followed by oil or water quenching, plus 915-950°F for about 2 hours followed by air cooling. The Applicant further argues that neither of these aging treatments meet or teach the claim language "aging the gas turbine engine component at a temperature of from about 900°F to about 1000°F." In response, the Examiner notes that instant claim 1 recites "comprising the steps of" and recites the steps of solution heat treating the forged gas turbine engine component at a temperature of from about 50°F to about 75°F below the beta-transus temperature and *thereafter* water quenching the gas turbine component which would allows for the presence of steps in between water quenching and the aging step of from about 900°F to about 1000°F, which allows for additional steps between solution heat treating and water quenching. Chakrabarti et al. ('624) teach a solution treatment in the range of

55°F to 85°F for 0.5 hour to 1 hour (col. 2, line 66 – col. 3, line 29), which overlaps the solution heat treating step of the instant invention, followed by water quenching, and then a heat treatment in the range of 915°F to 950°F for 8 to 24 hours (two-step process) (col. 3, lines 1-40).

Fourth, the Applicant primarily argues that none of the references have a teaching of “final machining the forged gas turbine engine component” and that none of the references have the teaching “the step of final machining includes the step of removing the alpha-case at a surface of the gas turbine engine component”. In response, the Examiner notes Chakrabarti et al. ('624) recognize that it would be desirable for the secondary alpha phase to be less than 1 μm thick (which includes 0 μm) (claim 3). Therefore, one of ordinary skill would look for a means of reducing and/or removing alpha case. However, all of the alpha case would not be formed until after aging (col. 3, lines 29-40). Therefore, one of ordinary skill would look for this means of reducing and/or removing alpha case after aging. Andinolfi et al. ('239) disclose that the alpha surface layer would be chemically milled in order to optimize aerodynamic performance and aid in eliminating variations, defects, and discrepancies (col. 1, lines 11-25). Therefore, the combination of these references would have been obvious.

Fifth, the Applicant primarily argues that none of the references teach “final machining the gas turbine engine component, wherein the thick portion has a 0.2 percent yield strength of from about 120 ksi to about 140 ksi at its centerline, and a 0.2 percent yield strength of from about 160 ksi to about 175 ksi at a location about $\frac{1}{2}$ inch below a surface thereof”. In response, the Examiner notes that Chakrabarti et al. ('624)

disclose that typical forgings would have yield strengths (0.2% offset) above about 140 ksi (col. 3, lines 41-52) and Adinolfi et al. ('239) discloses chemical milling to remove alpha case, which would be a type of final machining. Furthermore, the arguments of counsel cannot take the place of evidence in the record. MPEP 2145.

Sixth, the Applicant primarily argues that the ASM Handbook is nonanalogous art because it does not deal with thermomechanical processing-it deals with heat treating only, as is made clear by the title of the section and also the absence of any discussion of forging or any other deformation processing and alternatively, the ASM Handbook is not within the scope of the prior art that may be used in forming a 103 rejection. The Examiner respectfully disagrees. The Examiner notes that both the primary reference Chakrabarti et al. ('624) and the ASM Handbook teach the heat treatment of titanium alloys and specifically Ti64 alloys. Mainly, the ASM Handbook is relied upon to obtain a more detailed explanation of the time periods associated with solution treating and quenching process as would be expected in Chakrabarti et al. ('624).

Seventh, the Applicant primarily argues that the ASM Handbook teaches away from the instant invention because the ASM Handbook teaches that "When a Ti-6Al-4V section thickness exceeds 75 mm (3 in.), it is difficult to cool the center fast enough to maintain an unstable β phase. For this reason, the solution-treated and aged properties of Ti-6Al-4V large sections are similar to annealed properties." and this would be a waste of money. The Examiner acknowledges that the ASM Handbook teaches that having less than 3 inch size sections would be preferable. However, the Examiner also

notes that less than 3 inches, as specified by the ASM Handbook, would overlap the range of greater than 2-1/4 inches, as in the instant invention.

Eighth, the Applicant primarily argues that the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org would not relate to Chakrabarti et al. ('624) because www.timet.com/metal64frame.html as archived by www.web.archive.org does not relate to thermomechanical processing, such as forging, and its teachings are not relevant. The Examiner notes that both the primary reference Chakrabarti et al. ('624) and the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org would teach the heat treatment of titanium alloys and specifically Ti64 alloys. Mainly, the website disclosure of the Titanium Metals Corporation found at www.timet.com/metal64frame.html as archived by www.web.archive.org is relied upon to limit the section thickness which does not appear limited in Chakrabarti et al. (624).

Ninth, the Applicant primarily argues that Bewlay ('956) teaches away from the instant invention by teaching the use of Ti6242 alloy; teaching forging to thin sections; teaching an absence of post-forging heat treating of the type recited in the present claims; the Ti6242 alloy is an alpha or near-alpha titanium alloy and Ti64 is an alpha-beta titanium alloy; and that Bewlay ('956) teaches forgings that are 2.8 cm (about 1.1) roughly the same thin forging as taught by Chakrabarti et al. ('624) and in both cases much less than the minimum thickness recited in the present claims. In response, the Examiner notes that Bewlay ('956) does not provide a motivation to limit the thickness;

Bewlay ('956) discloses that the method would be applicable to turbine components (col. 4, lines 32-47) and Chakrabarti et al. ('624) disclose that Ti64 alloys would be used as turbine components (col. 1, lines 11-21). Therefore, it would be expected that the ultrasonic inspection method disclosed by Bewlay ('956) would be applicable to the titanium alloy disclosed by Bewlay ('956) because both Bewlay ('956) and Chakrabarti et al. ('624) teach titanium alloy turbine materials. Bewley ('956) teaches a step of ultrasonically inspecting the workpiece after the step of forging the workpiece and before the step of heat treating.. In summary, there are four ultrasonically inspected samples. These samples include a conventional billet (no treatment); a forged version of the conventional billet; a uniform fine grain UFG billet (a conventional billet that has been forged into a shape (col. 5, lines 30-43)); and a forging of the UFG billet. The forged version of the UFG billet would be characterized by press forging at 900°C (heat treatment) (col. 6, lines 1-14).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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